WHAT IS CLAIMED IS:

1. A method for designing a low drag vehicle comprising:

determining a plurality of aircraft configurations for at least two different Mach numbers that minimize the rate of change of second derivatives of cross-sectional area of the vehicle; and

averaging the configurations to determine a final configuration.

2. The method according to Claim 1 further comprising:

optimizing the aircraft configuration for cross-sectional areas obtained along Mach angle lines.

3. The method according to Claim 1 further comprising:

smoothing the second derivative of cross-sectional area for the final configuration.

4. The method according to Claim 1 further comprising:

weighting the configurations for the at least two Mach numbers.

5. The method according to Claim 1 further comprising:

integrating the second derivative of cross-sectional area for the final configuration to determine the cross-sectional area.

6. The method according to Claim 3 wherein smoothing the second derivative of cross-sectional area includes filtering the rate of change of cross-sectional area for the final configuration.

7. The method according to Claim 1 further comprising:

determining weighting factors for the at least two Mach numbers based on a percentage of time the vehicle is expected to operate at each Mach number during typical operational profiles.

8. The method according to Claim 1 further comprising:

determining weighting factors for the at least two Mach numbers based on at least one of the group of: minimized drag, minimized sonic boom disturbance, and minimized inlet flow distortion.

9. The method according to Claim 1 further comprising:

wherein smoothing the second derivative of the cross-sectional area includes averaging the value of a selected point of second derivative of the cross-sectional area with the point before and a point after the selected point.

10. The method according to Claim 1 further comprising:

wherein the vehicle is an aircraft.

11. A design system comprising:

logic instructions operable to:

allow a user to specify design objectives and constraints;

determine a plurality of vehicle configurations for at least two different operating conditions that minimize the drag of the vehicle within the specified design objectives and constraints; and

average the configurations to determine a final configuration.

12. The system according to Claim 11 further comprising:

logic instructions operable to:

optimize the cross-sectional area of the at least two vehicle configurations.

13. The system according to Claim 11 further comprising:

logic instructions operable to:

smooth the second derivative of cross-sectional area for the final configuration.

14. The system according to Claim 11 further comprising:

logic instructions operable to:

weight the at least two configurations at different operating conditions.

15. The system according to Claim 11 further comprising:

logic instructions operable to:

integrate at least one of the rate change of cross-sectional and the rate of change of cross-sectional area for the final configuration to determine the cross-sectional area.

16. The system according to Claim 11 further comprising:
a computer processor configured to execute the logic instructions.

17. The system according to Claim 11 further comprising:
logic instructions operable to:
smooth at least one of the first and second derivative of cross-sectional area to determine the cross-sectional area of final configuration.

18. The system according to Claim 11 further comprising:
logic instructions operable to:
determine weighting factors for the at least two operating conditions based on the difference between thrust available and thrust required.

19. The system according to Claim 11 further comprising:
logic instructions operable to:
determine weighting factors for the at least two operating conditions based on at least one of the group of: minimized drag,, minimized sonic boom disturbance, and inlet flow distortion.

20. The system according to Claim 11 wherein the logic instructions to smooth the second derivative of the cross-sectional area include averaging the value of a selected point of the second derivative of the cross-sectional area with a point before and a point after the selected point.

21. The system according to Claim 11 wherein the vehicle is an aircraft.

22. A vehicle comprising:
a main body portion; and
a fin extending from the main body portion, wherein the cross-sectional area of the fin is reduced in the vicinity of the juncture of the fin and the main body portion, and the configuration of the vehicle is derived from the average of at least two configurations of the vehicle optimized for different Mach numbers.

23. The vehicle according to Claim 22 wherein the cross-sectional area of the at least two vehicle configurations are optimized.

24. The vehicle according to Claim 22 wherein the second derivative of the average cross-sectional area of the at least two configurations is smoothed.

25. The vehicle according to Claim 22 wherein the at least two configurations are weighted before the average of the at least two configurations is determined.

26. The vehicle according to Claim 22 wherein the vehicle is an aircraft.